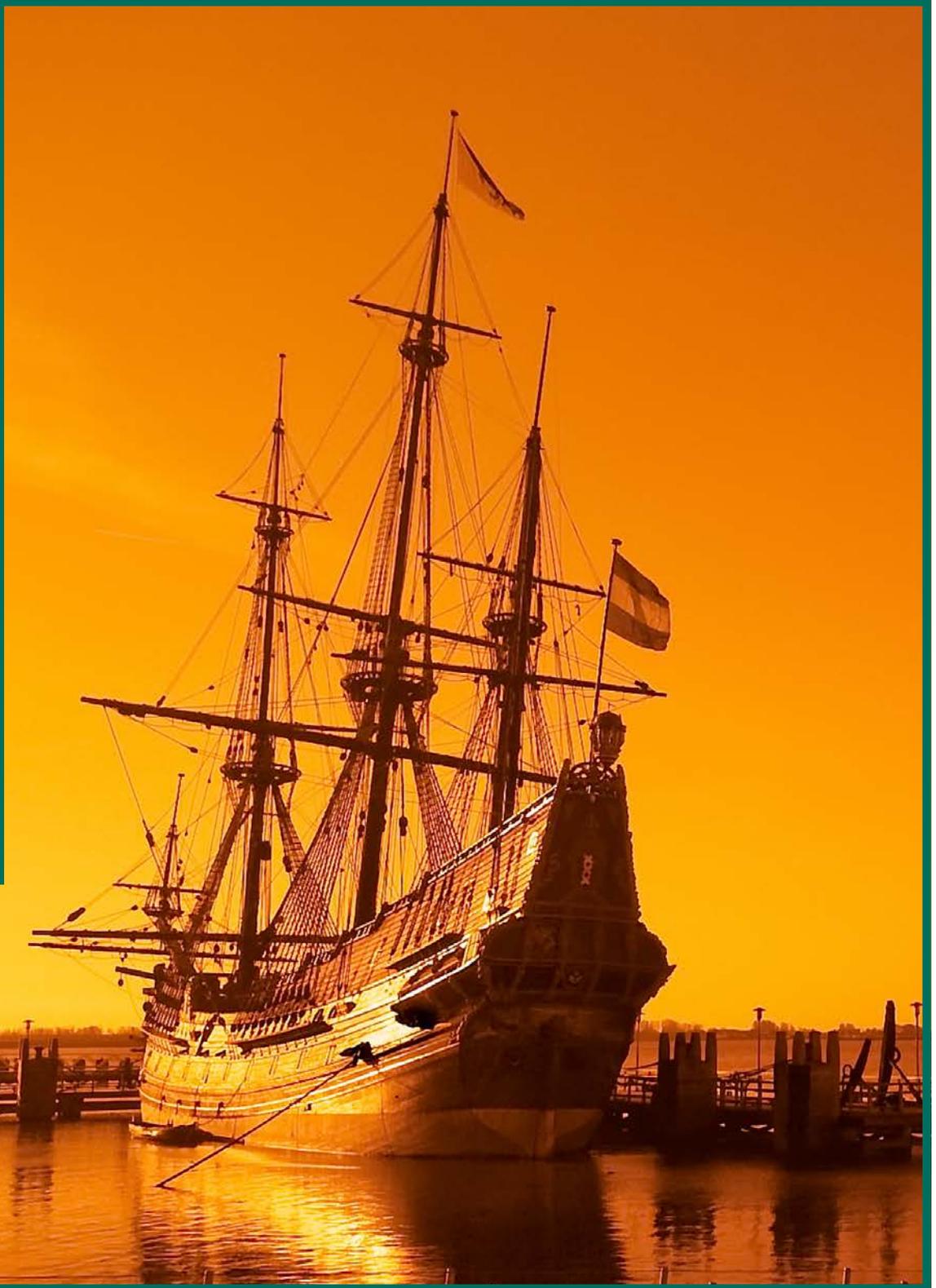


Student Edition

California Education and the Environment Initiative

8

History-Social
Science Standard
8.6.3.



America Grows

California Education and the Environment Initiative

Approved by the California State Board of Education, 2010

The Education and the Environment Initiative Curriculum is a cooperative endeavor of the following entities:

California Environmental Protection Agency
California Natural Resources Agency
California State Board of Education
California Department of Education
Department of Resources Recycling and Recovery (CalRecycle)

Key Partners:

Special thanks to **Heal the Bay**, sponsor of the EEI law, for their partnership and participation in reviewing portions of the EEI curriculum.

Valuable assistance with maps, photos, videos and design was provided by the **National Geographic Society** under a contract with the State of California.

Office of Education and the Environment

1001 I Street • Sacramento, California 95814 • (916) 341-6769

<http://www.CaliforniaEEI.org>

© Copyright 2011 by the California Environmental Protection Agency

© 2013 Second Edition

All rights reserved.

This publication, or parts thereof, may not be used or reproduced without permission from the Office of Education and the Environment.

These materials may be reproduced by teachers for educational purposes.



Contents

LESSON 1 In Search of Ecosystem Goods and Ecosystem Services

*California Connections: Basques, the Shepherds
Who Flocked to California* 2

LESSON 2 Blowin' in the Wind

It all Started with Ashes 6
One Potato, Two Potato 8
Family Backgrounds 10

LESSON 3 Across the Sea: U.S. Cities in the 1800s

Boston City Pack 22
Chicago City Pack 25
New York City Pack 28
Philadelphia City Pack 31

LESSON 4 Settling In and Moving On

None required for this lesson.

Basques, the Shepherds Who Flocked to California



It takes all your strength to pull open the heavy door with its bent metal pull. Once inside, you face a long table, groaning with huge bowls of lamb, beef, chicken, and shellfish. There are beans seasoned with garlic and onion, and fresh loaves of shepherd bread baked in heavy Dutch ovens. Your new friend, Amador, raises his glass when he sees you.

Everyone around the table follows his lead. “To my new friend,” he says. “Welcome!” You have never felt so welcomed in your life.

You met Amador when you were hiking with your family on the east side of the Sierra Mountains. You rounded a bend in the trail, and suddenly he was there, walking along with his trusted sheepdog by his side. On the hills above him were a thousand grazing sheep. You were amazed at the way he and his dog could keep them in line! You asked Amador a few questions about shepherding, and soon he was telling you about how the Basque people had come to live in California.

When you asked where he was from, Amador smiled. His people were a people



Sheep dog guarding sheep



Basque children dancing

without a country—or at least without one to call their own. The Basque homeland, he explained, lies along the coast of the Bay of Biscay in the western Pyrenees Mountains. It consists of seven provinces along the border of two countries—four in Spain and three in France. People from this region are only considered Basque if they

speak Euskera, a language that is only spoken by Basque people and their ancestors.

You asked Amador who his ancestors were. He told you that historians are not sure. The Basques may be related to ancient Berber tribes, the North and South American natives, the Celts, or even the ancient Egyptians.

Amador explained that his people are a very rare group

of human beings. The Basque people speak a language like no other. Though they are from Europe, their native language is not related in any way to European languages.

Reasons to Emigrate

Why did the Basque people come to North America? Amador told you that it was difficult to stay in the Pyrenees in the mid-1800s for several reasons. A period of drought caused crops to fail, and people did not have enough food for themselves or their many children. An ancient Basque custom also forbade the breaking up of land for inheritance. As older people died, this left some adult children without a home or any way to support their families. Finally, new laws were passed that caused the Basques to lose their rights. After this, many Basque people believed that they might find a new and better life somewhere else in the world.

Some Basques immigrated to French Canada. Many others settled in Latin America, especially Chile and Argentina. Cattle and sheep industries in these countries allowed the Basque people



Basque shepherd

to make a good living. When gold was discovered in the Sierras, the Basques came to California to try their hand at mining. Most of them were not successful. Instead, they stayed in California and made their living as shepherds, selling lamb and baking their traditional bread for the miners.

In the last part of the 19th century, conditions improved for people emigrating from Europe. The newly opened transcontinental railroad made it easier for people to do business coast to coast. Europeans could enter the United States at the eastern seaboard and cross the land by rail to the American West.

For the Basques, the West that meant the Great Basin States—most of Nevada, over half of Utah, and parts of California, Idaho, Oregon, and Wyoming—as well as Montana and Washington state.

Shepherding

Amador continued with his story. The Basques were already the prime shepherders in southern California by the late 1850s. They moved their flocks as the seasons changed to find better pastures for grazing. In this way, they took advantage of the best the local natural systems had to offer at the best time of year. This practice brought large profits to Basque shepherders.

“Raising sheep had advantages,” Amador told you. They could survive in the semi-arid pastures of southern California and the high desert foothills east of the Sierras. At that time, there was an open grazing policy on public lands, a ready-made market for wool, and easy access to cheap land.

As their herds and operations grew, Basque shepherders started a chain

of migration that brought thousands of Basques to the American West. The majority of Basque immigrants were semi-literate single men from rural areas. Basque herders were true nomads; they only had to invest in a tent, a bedroll, and a dog to make it as a shepherd.

Because of their isolated life, their limited knowledge of English did not keep them from being successful at work. They enjoyed job security in their shepherding jobs. Herders often asked to be paid in sheep rather than money, so they could start their own herds. Some Basque herders sold their operations after a few years. They then had enough money to go back to the Pyrenees and establish a farm or other business in their homeland.

Hospitality

There was another secret to Basque success—the Basque hotel. “Hotel” is a loose term for a series of boarding houses, a home away from home for these workers. Besides offering lodging when the men were between jobs, they acted

as informal employment agencies, recreation centers, and social and cultural hubs. The owners of these “hotels” stored the shepherds’ personal belongings while they tended their flocks. Basque hotels eased new immigrants into American life by reducing cultural shock and encouraging friendship and support. One such Basque hotel was the Uriz Hotel in Marysville, which was a Basque restaurant run by Victor Uriz for many years after the men moved out in the mid-20th century. The building is still standing between the railroad trestle and the levee on A Street between 4th and 5th.

Immigration Laws

Amador told you that Basque migration finally slowed in the 1920s when new laws limited the number of immigrants that could enter the United States. Soon, there were fewer Basques to run the shepherding operations in California. The situation became critical as older herders began to retire, die, or return to Europe.

In 1950, the “Shepherd Bills” removed some immigration roadblocks. The state changed the laws once more, allowing sheep operations to recruit herders from overseas. If employers could prove that the Basques

could do the job better than American workers, they could issue a renewable contract. Thousands of Basques took advantage of this new opportunity to immigrate to America.

Since the 1970s, conditions have improved in Europe. With better wages and politics, there is little reason to leave. After more than 125 years, the Basque migration is over—leaving nearly 48,000 Basques in the United States today—over half of them in California.

A Shared Past

Amador shows you a seat in the middle of the long table. You look around at the many smiling faces and then heap your plate with delicious food. The people that surround you are from many walks of life. Some are teachers, restaurant owners, and contractors. Some, like Amador, are still in the sheep industry. You can see that all that matters is that they are here together, celebrating their shared past. Amador leans over. “Help yourself,” he tells you. Soon, there will be singing and dancing that will last into the night.



Basque men

Instructions: Read this report about the effects of volcanic eruptions in the early 1800s. As you read, make a list of the items that are part of a natural system. Also, make a list of the resources that humans get from natural systems.

It All Started with Ashes

The 1800s were a busy time for volcanoes. Eruptions occurred in the West Indies in 1812. In 1814 there were more eruptions in the Philippines.

Then, on April 10, 1815, Mount Tambora in Sumbawa, Indonesia, erupted. It threw more than 150 million tons of ash into the air. It is estimated to have killed 60,000 to 70,000 people in the Indonesian region. Scientists say this was one of the most severe eruptions of the past 10,000 years.

Volcanic eruptions always affect the areas closest to them. Ash fills the air, and hot, molten lava covers the ground. The fiery embers thrown from the volcano burn plants and animals. Others caught in the lava's path also burn. Even living things nowhere near the volcano can feel its effects.

The ash from an active volcano can actually color the sky and affect the air around the world. Because it is so lightweight, ash takes a long time to settle to the ground. It swirls in the wind

and follows the weather systems and wind currents for years before it all settles on the soil, rivers, seas, and oceans. When the ash from many volcanoes collects in the upper atmosphere, it can actually block the light and warmth of the Sun. That is what happened in 1816.

How Natural Systems Were Affected

Because the sunlight could not get through the ash, the weather changed. The temperature that summer averaged only 53° F (12° C) in Europe. In Ireland, rain fell 142 out of 153 days between May and September. In



Volcanic ash

America's Northeast, the daily low temperature was below 30° F (-1° C). New England and New York had snowstorms in June. Ice formed on rivers and lakes. In Italy, red snow fell. Soon, the year 1816 earned the name the "Year Without a Summer."

America's Northeast and Northern Europe felt the effects of the "Year Without a Summer." The cold temperatures, snow, and frost killed off most of the crops. Almost nonstop rain killed the crops that survived the cold. Rivers rose and flooded the areas around them. The pastures could not grow grass and other plants for livestock to graze on. Once the winter's supply of hay was gone, the cattle, poultry, and horses needed the corn set aside for people. This left little food for the people themselves.

How Human Communities Were Affected

People began to panic. There was not enough food for them to eat. What would they live on over the next winter? There was not going to be enough fruit or vegetables to dry or preserve. There would not



Flooded farm field

be enough grain, hay, or corn to store for their livestock or themselves. Poorly fed animals can neither work a farm nor provide a good meal for people.

Food riots broke out in the areas that are now Germany, France, and Switzerland. The scant amount of food available cost too much for working people to afford. And the constant cold and dampness provided perfect conditions for typhus to develop. That year, more than 200,000 people died throughout Europe of hunger, typhus, and recurring fevers, a combination known

as "famine fever." Talk of revolution rumbled throughout Germany and France. Another crop failure (which would happen in Germany in 1846–47) would push people to revolt against the government.

The effects of the "Year Without a Summer" wiped out entire communities throughout Europe. People began to look west at land in the Americas. They may not have known what this new area was like, but they guessed it had to be better than what they were leaving behind. Surely it could not be any worse.

Instructions: Read this report about the Irish famine. As you read, make a list of the items that are part of a natural system. Also, make a list of the resources that humans get from natural systems.

One Potato, Two Potato

In 1590, the Irish began to grow a new plant that the Spanish had brought back from South America—the potato. They found that the plant did well in Ireland’s cool, damp climate. During the 18th and 19th centuries, they developed new types of potatoes. These “new” potatoes performed even better, yielding larger harvests. Because farmers could grow more potatoes per square foot than any other crop, more and more farmers grew only potatoes.

The strain of potato that the Irish cultivated was nearly a “complete food.” When eaten with milk, it provided a balanced diet. It had all the protein, carbohydrates, vitamins, and minerals a person needed. The Irish came to depend on the potato for both food and income. The sale of potatoes paid the rent and fees that the farmers owed the landlords. Thus, potatoes also made a good income for the landowners.

In 1845, a fungus from the Americas arrived in Ireland. Strong and unusual wind currents blew the fungus from the holds of European trading ships onto the Irish coast. The fungus, which flourished in Ireland’s cool, damp climate, infected the

Irish potato plants. At first, everyone thought that the crop failure was a one-time event. By the fall of 1846, however, people clearly saw that another year’s crop was infected.

How Natural Systems Were Affected

Because of the way potatoes grow, one infected plant quickly infected others. Soon the fungus had wiped out the entire nation’s potato crop.



Potato plants in bloom

The spores of the fungus developed on the leaves of the potato plant. If the leaves got wet with rain, the spores moved to the soil. In the soil, the fungus attached itself to the potatoes growing underground.

The fungus then ate away at the developing potato, keeping it from growing to its full size and using up all its nutrients. The potatoes that grew looked shrunken and had the texture of a cork. They were not edible and lacked the important vitamins and minerals a healthy, full-size potato would normally have.

Once the fungus got into the soil, or on the leaves of the potato plants, destroying it was almost impossible without strong pesticides—and the Irish did not have any of those. One solution was to chop off all the leaves of the plants to get rid of the spores. But then the plants died anyway, as they could not photosynthesize without their leaves.

The potato crop improved a bit in 1847. The harvest was small, but at least it was healthy. Everyone hoped the worst was over. But the blight



Blight-infested potato

came back in 1848 and again in 1849. Those two years saw nationwide crop failures. In 1849, Ireland also endured a cholera epidemic.

How Human Social Systems Were Affected

Because the Irish farmers relied on potatoes for both food and income, the blight had a great influence on them. Without the potato crop, the farmers had no way to pay rent to their landlords. Because there was no crop, the landlords could not make any money from its sale. Without potatoes to eat,

thousands of people starved.

Thousands of Irish starved to death during the winter, but many more died from the complications of a combination of health problems called “famine fever.” Famine fever made people too ill to properly take care of themselves. Frequently, dysentery broke out in areas filled with people suffering from the famine.

During the 1800s, almost a million Irish people died due to the famine and fever. Another million emigrated, going almost anywhere they could to find work and food.

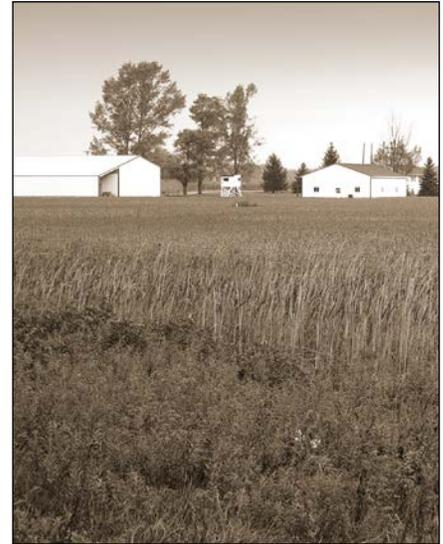
The Bauer Family

The Bauers are wheat farmers in Luxembourg, living on the rolling plateau of the fertile Bon Pays, in the south. The family farm is small, less than 200 acres.

The Bauers grow wheat, barley, and root vegetables on their farm. For many years, their small farm produced sufficient grain to support the family. Their crop was ample enough to supply their own table and to sell for income. However, achieving this success required the efforts of all family members.

None of the family members has attended school. Yet they

all speak several languages—German, French, Dutch, and Luxembourgish. People in their area speak many languages because, over the years, wars made the area a part of Belgium, the Holy Roman Empire, the German Confederacy, and the Netherlands. The Bauers have found that being able to communicate in many languages helps when they go to market to sell their crops. Also, the Bauers have a family tradition of teaching their children to read, write, and do basic computations (math). The evening hours and winter



Farm house and barn

seasons, when work on their farm stops, give the parents the opportunity to teach the children at home. Both Herr and Frau Bauer learned from their parents to read, write, and compute in a similar way.

The “Year Without a Summer” has destroyed their small farm. Excess rain has caused the nearby rivers to flood. It has also killed off plants in the fields. Crops that had started to grow have rotted in the standing water. As winter approaches, the fields are still flooded. If the flooded land freezes, the Bauers will not be able to prepare the soil for next year’s planting.

The wet, cold weather has brought disease, too, because flooded land does



Flooded field

Family Backgrounds

Lesson 2 | page 2 of 12

not drain. Without proper drainage, human and animal waste stays on the land rather than draining away. Typhus and dysentery have already appeared in nearby communities. A number of the Bauers' friends have died in the typhus epidemic. The Bauers count themselves lucky that they have not come down with either disease, at least not yet.

How will the family get through winter? They have enough money saved to buy more food, but there's no food available at the market. The change in weather has affected everyone's harvest.

They do not know how they will feed their horses,



Skinny horse

the animals they rely on to help with farming tasks and transporting their grain to market. They usually feed the horses the poorest quality grain from their crop. But they fear that this year

the family may have to eat that grain themselves—leaving none for the horses. They could use the horses for food, but doing so will definitely keep the Bauers from planting next year. With no horses to plow the fields, cultivating the land frozen for almost a year will be almost impossible!

Frau Bauer has relatives in Pennsylvania. Her great-uncles, great-aunts, and their children have lived there for almost 50 years. One runs a newspaper and another is a baker. The uncles say that there are plenty of German-speaking people and resources (schools, jobs, land) in America.



Sailing ship

The Schafer Family

The Schafers raise Merino sheep at the base of the Alps. They sell the meat and wool the sheep produce.

Frau Schafer is a widow—her husband died fighting in the Napoleonic Wars. She and her two daughters herd their sheep, raising them for their wool and meat. The girls take the sheep out every day to the fields to graze, returning 10 hours later. Then, the girls milk the sheep; they make cheese from the milk.

The family also has dogs that help with the herding, protect the girls when they are out in the fields alone, and guard the Schafer home at night.

While the sheep are grazing during the day, the girls mend, sew, and knit—anything that’s small enough for them to carry into the fields. The girls scavenge the fields for lunch, finding fruit and nuts to eat; occasionally they take some

cheese with them. Twice a year, the family hires some men to help shear the sheep, whose wool they sell at the market or spin into yarn to sell.

As the Schafers live in a small cottage, there’s not much to clean, although the sheep and dogs do require some additional care. In the fall, the family kills a few of the older sheep, and Frau Schafer and the girls make meat pies to eat and to sell.



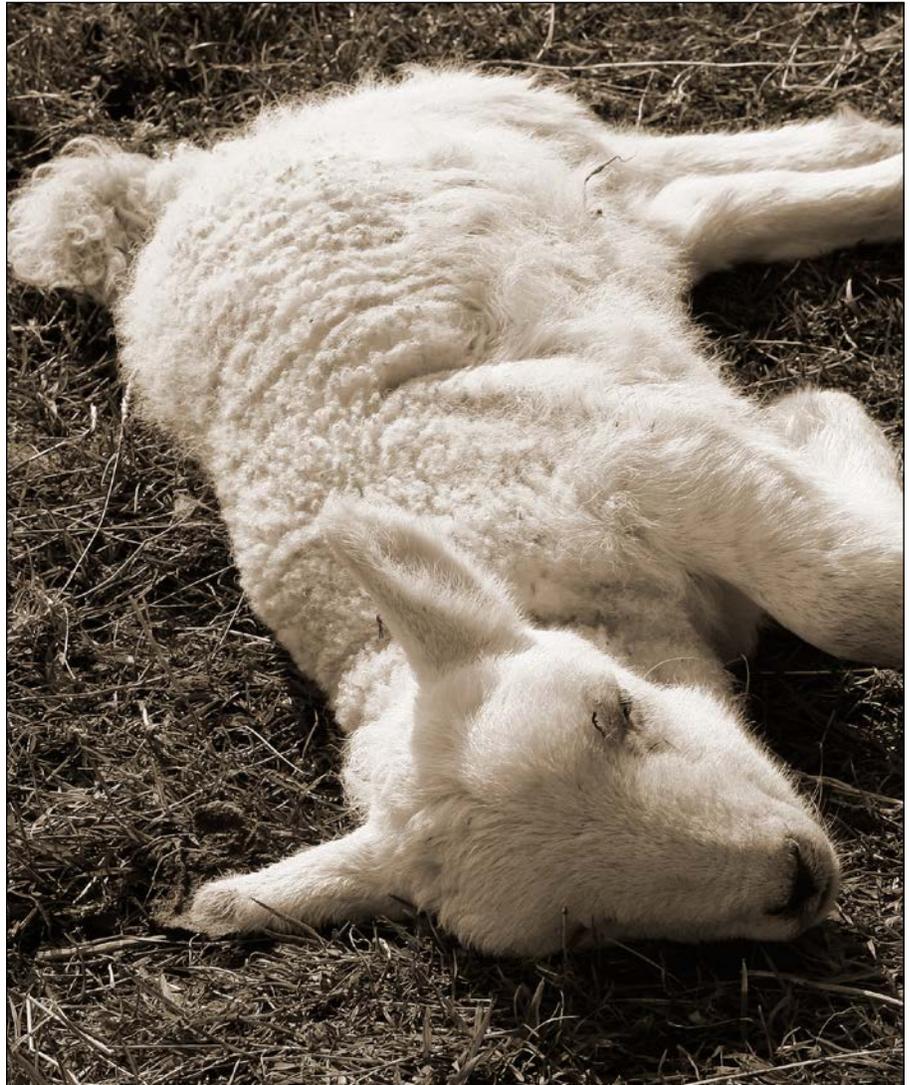
Sheep grazing

Family Backgrounds

Lesson 2 | page 4 of 12

This year—the “Year Without a Summer”—the Schafers have had a great deal of trouble. The low temperatures, constant rains, and flooding have kept grass and clover from growing in the fields. As a result, the sheep have nothing to graze on. Without enough food to eat, the animals are slowly starving. As they weaken in the cold, wet environment, they are becoming ill.

The Schafers cannot sell the meat of sick animals for food. But if they slaughter the healthier animals, they will literally be killing off their future; they will not have a flock for next year. And what will they do with all that meat? It will not stay fresh too long, given the wet environment. Meanwhile, this weather has caused a famine in their area—there’s no wheat and only a little rye and barley. Because there’s so little grain, the price is sky high and the Schafers cannot afford to buy any. So the family is always hungry—what grain they can get, they are giving to the herd, to try to keep the sheep alive. The girls are learning to hunt and trap, trying to kill some small wild animals to eat.



Sick lamb

Along with famine, typhus is spreading throughout the area. Reports of typhus and “famine fever” are making their way to the Schafers’ peaceful mountains. So is news of food riots in the cities and towns of neighboring Switzerland and nearby France.

Frau Schafer sits down with her daughters to decide what they should do. They could sell what is left of the herd (or slaughter it and sell the meat)—if they can find anyone with enough money to buy it. Then they could pack up and move somewhere else. But where?

The Eisenhower Family

The Eisenhowers are coal miners from the city of Essen in the Ruhr Valley.

Coal from the Ruhr Valley fuels German factories and warms people's homes. Like farming, coal mining is a family business. Children go into the mines to help dig, since they can fit into places where grown men cannot. Both the children, Konrad and Freide, have worked in the mines. As the mines themselves are always dark, the idea of "day" or "night" does not affect mining. Thus, unlike farming, coal mining goes on around the clock, all year long. As a result, the children have no free time for schooling or play; they and their father work almost nonstop in shifts.

Now, following the Napoleonic Wars, the need for power and food has increased throughout Germany and Europe. So the miners in the Ruhr Valley are working even harder to meet the area's demand for power. The strange weather of cold days and excessive rain and snow have called for more and

more coal to heat people's houses. The bad weather has also wiped out this year's crops. There is not enough grain, vegetables, and fruit to feed the people or the animals the people rely upon. This means that the miners—who are doing hard, physical labor in the mines all day and all night—do not have enough food to maintain their strength or health. Frau Eisenhower has basically given up eating to make sure that her husband and children eat all that the family has. They need their strength so they will not be fired from their jobs.

In addition, the excessive rains caused by this "Year Without a Summer" have flooded and weakened the walls of the mines, making them unsafe. The mine shafts and tunnels are strengthened using timber harvested from the nearby forests, but the quality of the wood is becoming poorer and poorer because of the wet weather. The wood used in the mines cannot support the walls from the inside. Meanwhile, the surrounding land, completely cleared of the trees that had protected the soil, is flooding and destabilizing the ground



Coal

Family Backgrounds

Lesson 2 | page 6 of 12

above and near the mines. Cave-ins are becoming more and more common. Every day when she kisses her husband and children goodbye, Frau Eisenhower fears it may be for the last time.

If hunger, unending work days, and the unsafe mining conditions were not enough to worry about, the rain and floods, coupled with the famine from the crop failures,

have led to a typhus epidemic that is already working its way through the mining community. The city of Essen has lost almost one-third of its population to sickness or emigration. How will the Eisenhowers survive this year, even if they manage to avoid getting sick?

Herr Eisenhower would like to stay in Essen, where his family has always lived.

Should the family remain in the Ruhr Valley and hope they stay strong and employed? Or should they emigrate as many others have done? He has heard that there is a growing need for coal in America, Wales, Poland, and Canada, where they have large coal mines. Surely their mines could use good workers—and maybe they are safer.



Mine shaft with timber supports

The O'Connor Family

The O'Connors are tenant farmers with their own "potato plot," working the larger piece of a potato farm for a landlord.

Farmer O'Connor has lived his whole life on this farm. His father worked the farm before him, and his father before that. Potato farming has two intensive times of work: the planting and the harvest. Planting and harvest require many hands to dig the trenches, plant the seed potatoes, and harvest the crop quickly, to make sure that it does not rot. The children all help—even little Colleen. However, the rest of the cultivation process is pretty automatic. Potatoes can grow with little care or attention, except during frost or flood.

The family has to give most of the potato harvest to the landowner. Part automatically goes to the landowner, who sells the potatoes for his income. With the rest, the O'Connors pay their rent for the farm, provide food for the family, and set aside "seed potatoes" to start next year's crop.

The O'Connors do not have much money, but they do not really need it. Most of the people in their county use the barter system instead of cash.

People trade goods and services for what they need. If Farmer O'Connor needs to fix his thatch roof, he asks his neighbors for help. In return,



Healthy potato field

Family Backgrounds

Lesson 2 | page 8 of 12



Dead potato crop

he helps them when asked to do so. This system builds a close community. How well a person sticks to his word shapes his reputation. One of the families the O'Connors help out is the Flannery family. They have a boy a few years older than Mary O'Connor.

The O'Connor family has not learned to read or write English. They have little need for it as farmers. The girls learn housekeeping, cleaning, washing, and cooking, while the boys learn to tinker (repair tin ware) and mend and build. Both boys and girls

learn what they need to know about potato crops from their parents and neighbors.

The "Great Irish Famine" has caused many problems for the O'Connors. Without a crop, the landlord cannot make his income. So he is raising the rent he charges the O'Connors. However, since the family uses the same (non-existent) crop to pay its rent, they cannot make their payments.

Without a full potato crop, the family is slowly starving. Neither Farmer nor Mrs. O'Connor is eating—they are giving their food to their children. Instead of eating,

they're trying to live on water alone. Their neighbors are ill with "famine fever." Mrs. Flannery's youngest came down with typhus, and Mrs. O'Connor has sent Mary to help out.

The landlord has offered to send the O'Connors to America. In fact, he is "evicting" them in a week. The O'Connors have heard rumors that another landlord burned down a nearby farm to drive the tenant farmers off. The O'Connors fear that their landlord may do the same thing to them if they turn down his "offer."

The Malone Family

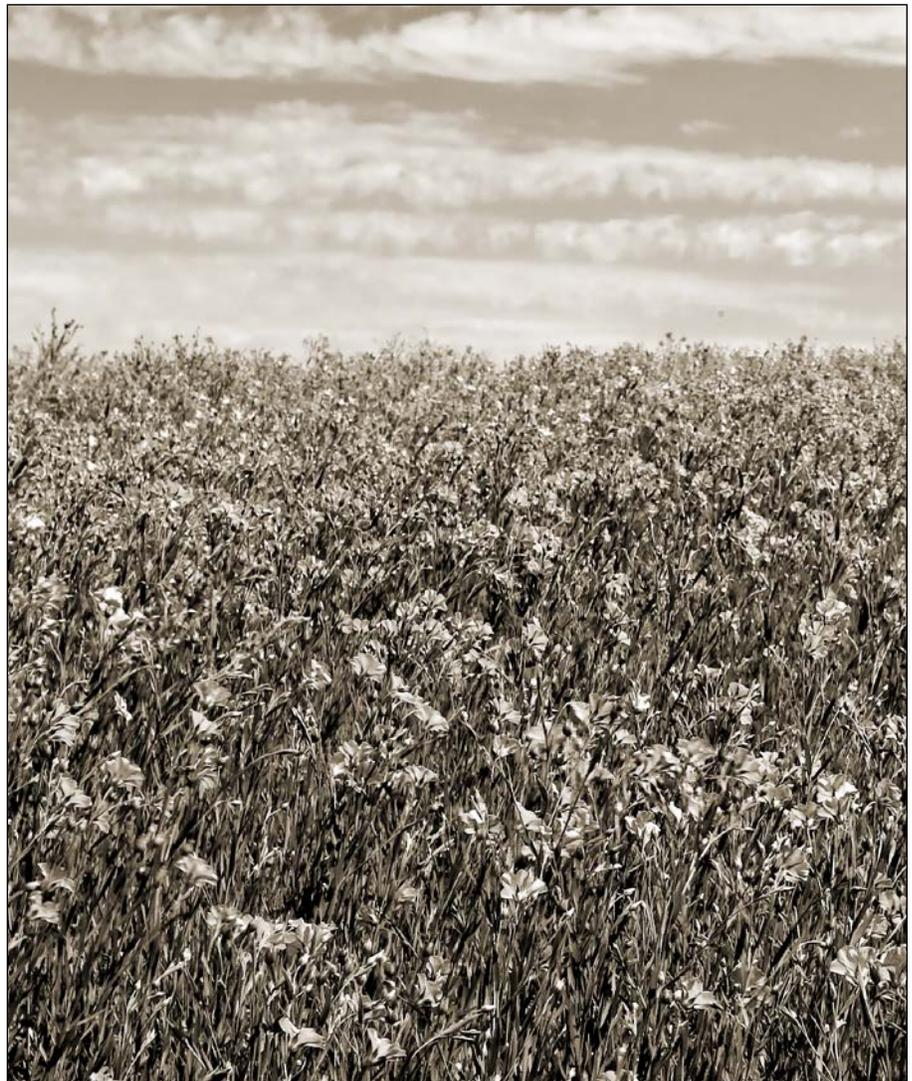
The Malones are growers of flax and weavers of linen in County Cavan. The family lives in a weaver's cottage in a neighborhood two miles outside of town.

The Malones (and their parents and grandparents before them) used to plant and harvest their own flax, which they spun into linen and wove into cloth. Because harvesting flax is a demanding job, the whole family was involved in the industry. But as mill factories were built in Northern Ireland, most of the linen industry moved. In the past five years, instead of harvesting their own flax, the Malones have found themselves working for larger factories far away, concentrating on weaving the fiber into cloth. They have seen their income reduced. Having lost an important source of income in harvesting and selling their own flax, they now depend on their tiny garden for food. Above all, they depend upon the potato.

Some of the priests at the church thought Sean would

make a good priest, so they taught him how to read and write. He is teaching his sister and parents. The Malones are special this way, as farmers have little need of reading and writing. Most of

the people in their county use the barter system instead of cash. People trade goods and services for what they need. This system has built a close community. How well a person sticks to his word shapes his



Flax field

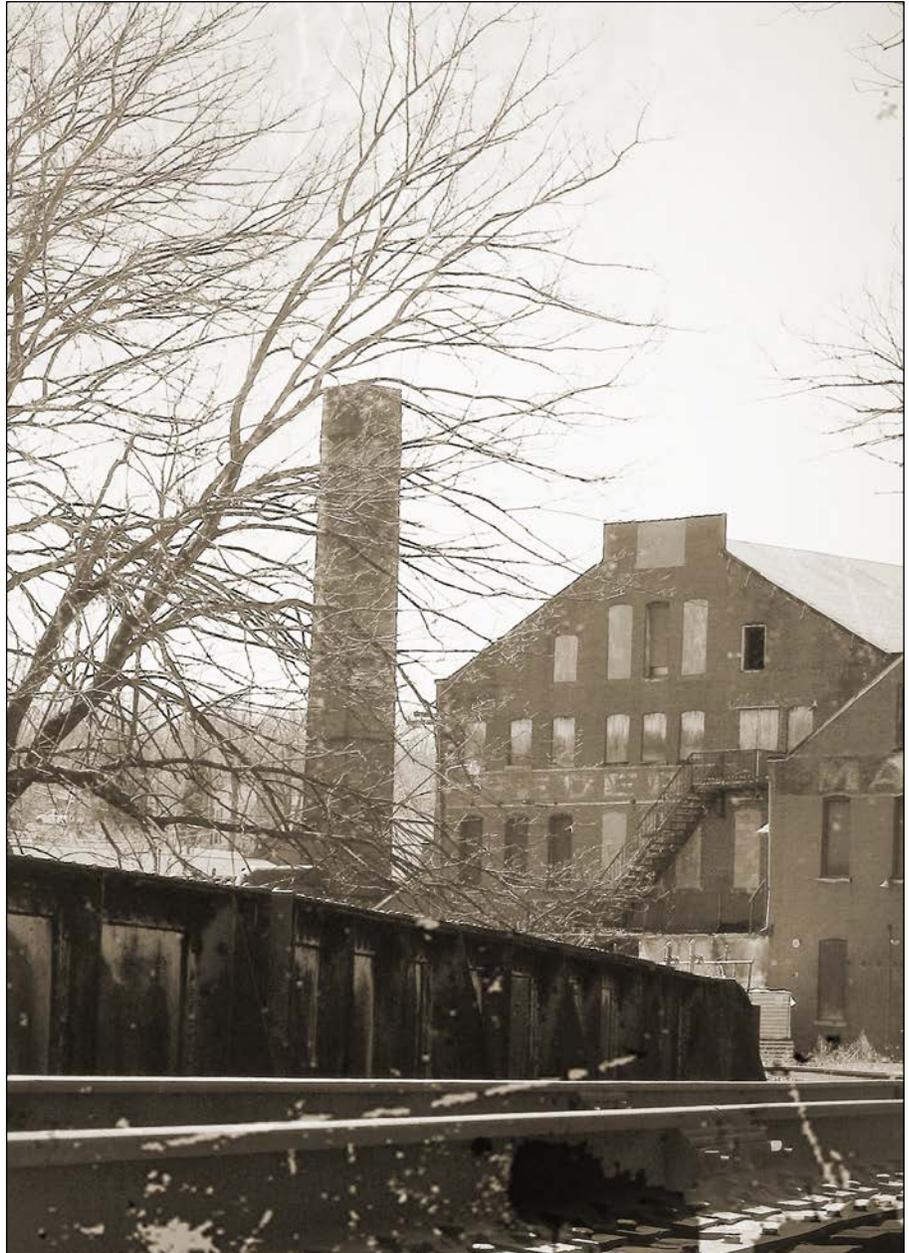
Family Backgrounds

Lesson 2 | page 10 of 12

reputation. What the Malones need to know about weaving and growing their own potato crop, they have learned from their family and neighbors.

The Malones' extended family has largely left the area. Mr. Malone's uncles saw their linen crop destroyed back in 1816 during the "Year Without a Summer." They vowed to never again depend upon a single crop. They left for America years ago to help build the Erie Canal. All three live in New York, along the route of the canal.

Mr. Malone's three brothers went to America a few years ago. They saw the changes in the linen industry, and instead of trying to compete with the big factories in the north of Ireland, they decided to open a small shop in America. They also knew their leaving would reduce the number of people who depended upon the small family farm for food. Mrs. Malone's brothers left Ireland for Boston just recently. Her uncle and her sisters' families are already living in a Belfast workhouse, ill and disabled from a



Old factory

variety of illnesses caused by a lifetime working with linen.

The Malones have three choices: stay in County Cavan and hope that their potato crop is better next year; migrate

north to Belfast and try to get steady work—and its steady income—at the factory mills; or head to America where both Mr. and Mrs. Malone already have family.

The Paddock Family

The Paddocks are dairy farmers who raise Dexter cattle and make butter from the milk. Those who sell their wares at the Cork Butter Market know the family well.

The Paddock children have no mother or father now. Their father died a few years ago, and they lost their mother and younger siblings to “famine fever” last year. Their mother took herself and her two youngest

children to the local hospital to try to keep the disease from spreading to the older children. All three died there.

Patrick, Margaret, and Seamus are taking care of the family’s five-cow herd and trying to keep up their family business of butter making. But churning butter and tending to five cows is hard work—even if it’s only seasonal—for three children. Recently, some of the

refugees from rural counties tried to steal two of their cows. The children stopped one set of rustlers, but others successfully made off with one of the herd.

Dairy farming relies mainly on two resources—the dairy cows and the grass and clover that the cows graze on. In the past, the family raised the cattle for milk and their young for beef, eating well and making butter to sell.



Cork County, Ireland



Dexter cow

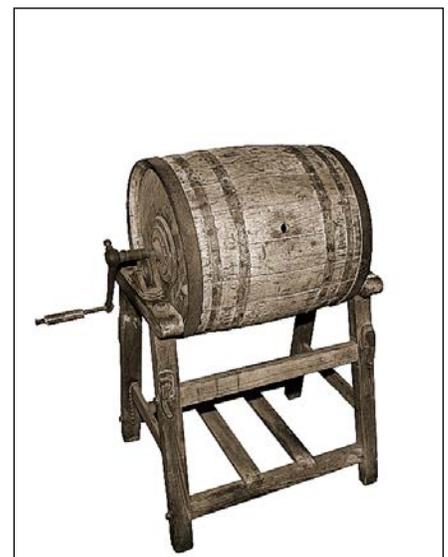
So, while famine decimated much of Ireland, the Cork butter trade and the Paddock family saw little direct effect until their mom and youngest siblings took ill. The city practically burst at its seams as the people suffering from “famine fever” came to the hospital, overcrowding the city and spreading the disease.

The Paddock children miss the life they had before their mom and younger siblings got sick and died. They shared in the care and feeding of the cattle and the making of butter. But with their mother and father’s help, they felt like they were playing, rather than hard at

work. They even had time to attend school during the winter, when milk production was less and the weather was too cold to churn butter. Now that their fate—and the fate of their herd—lies in their own hands, they realize just how much hard work their parents had to do.

Bad news is coming from Europe. The Paddocks heavily salt their butter in order to preserve it for the long trans-Atlantic trip to North and South America. But tastes are changing. People are finding the French and German butter (which is less salted) tastier—calling it “sweeter.” And there’s news of a cholera epidemic sweeping through Europe, too!

Patrick points out that if their butter can make the trip to the Americas, they can too. Right now the famine has not affected their livelihood. But how long can three children run the business, never mind keep rustlers from stealing the rest of their cattle? Besides, Margaret is quickly approaching marriageable age, and what are her options in famine-ravished Ireland? Plus, there’s only so much home-schooling Patrick and Margaret can give Seamus after working hard all day. Would not life be better for them in America if they sold their herd, took what little money they still have, and emigrated to another place where they could start fresh?



Butter churn

City Facts: Boston

More people coming to Boston in the 1800s created a greater need for drinkable water. More people also meant more human waste.

The original hilly peninsula on which the city stood covered 800 acres. Salt marshes, mudflats, and inlets of water surrounded the peninsula. As Boston outgrew the site in the 1800s, people leveled most of the hills. They used dirt from the hills to fill in those marshes and mudflats. This “new” land was then available as sites for building housing for all the extra people.

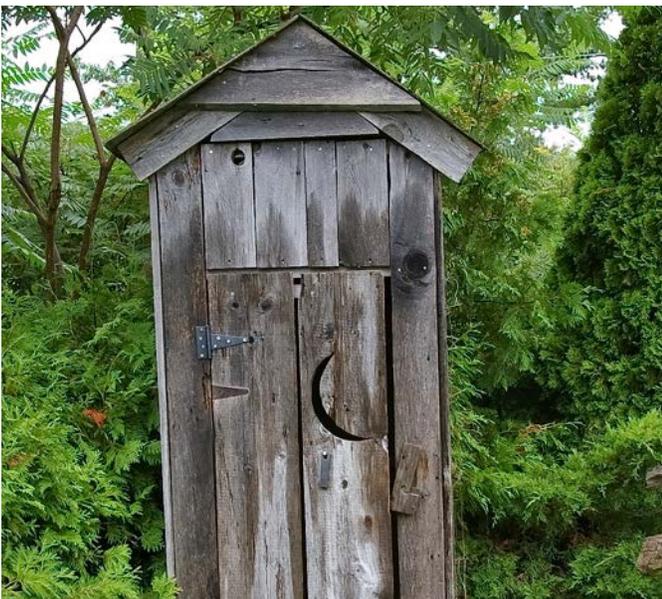
Two mill dams in Back Bay (1820, 1828) and two railroad bridges (1830) crossed the tidal flats. They trapped sewage-laden runoff between themselves and the shoreline. These structures blocked the natural flushing action of the tides. Thus, once the water close to the

city became contaminated, it stayed that way. Later, scientists discovered that these same structures stopped the flow of groundwater when the wetlands behind them were filled.

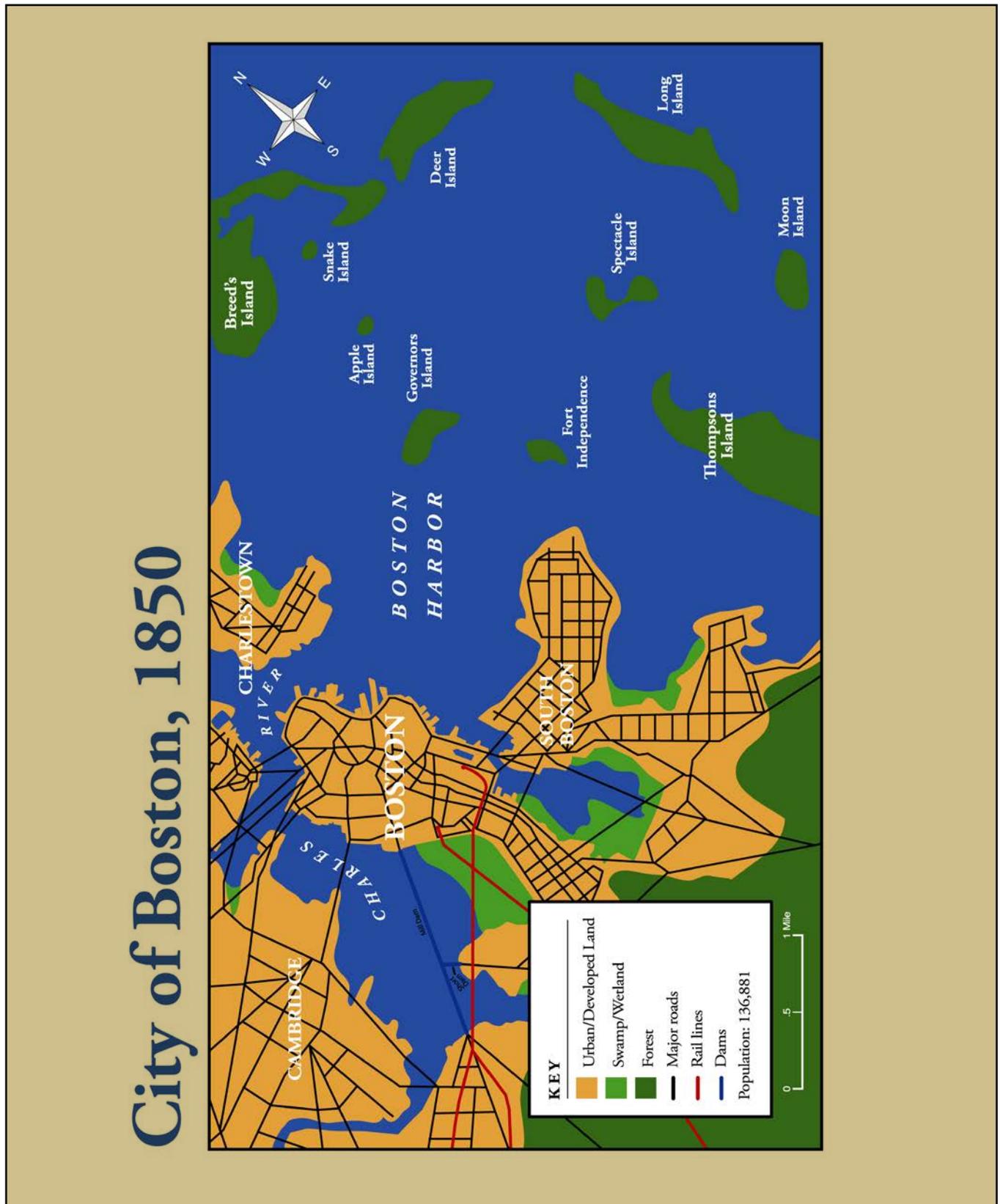
Sanitation was limited. People did not have inside toilets. Instead, they used chamber pots or outhouses. They buried the human waste in the ground or dumped it in pits. This “night soil” was then collected by “tubmen” and sold as fertilizer to farmers. The waste then seeped into drinking water wells, making people sick with cholera and other diseases.

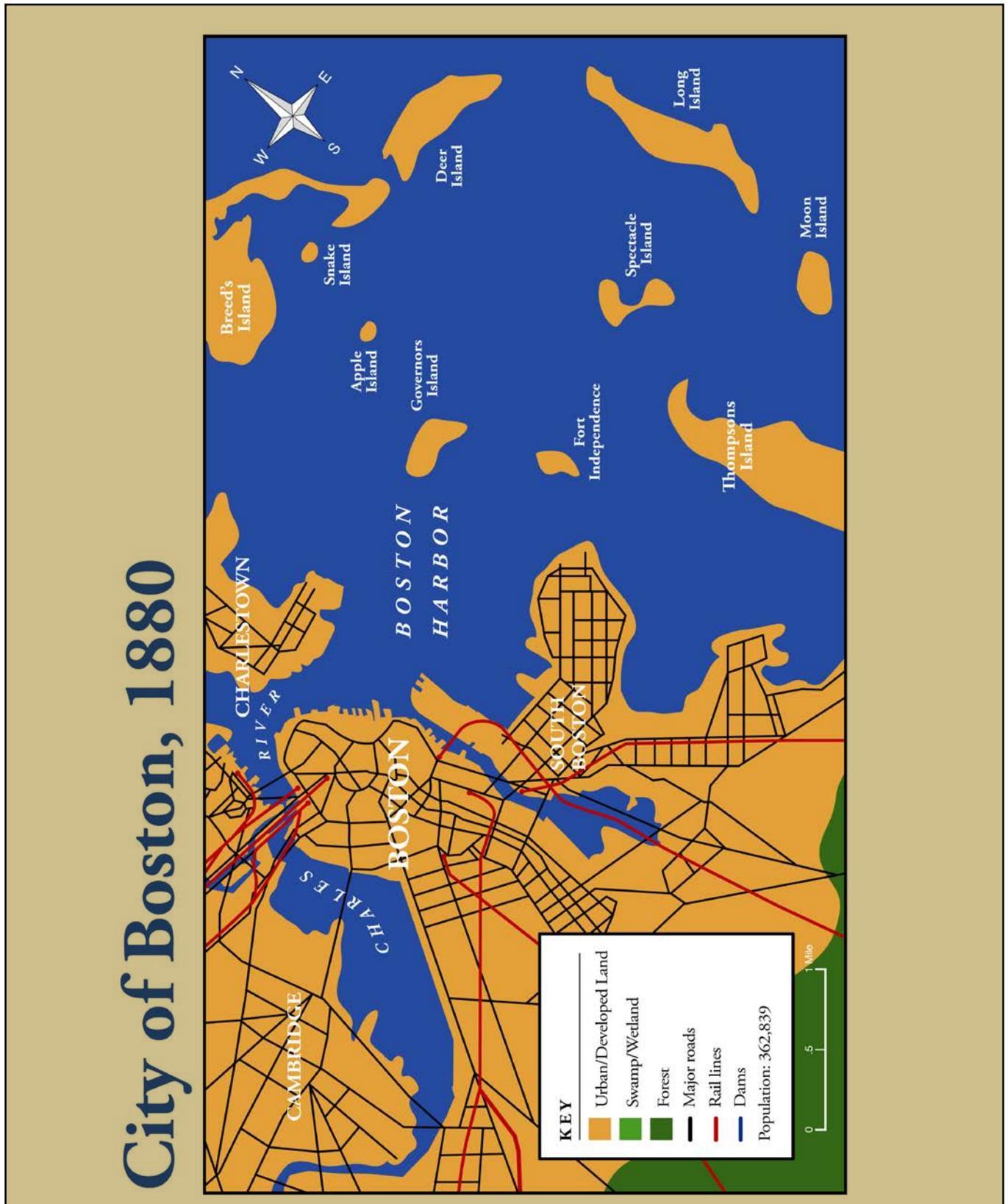
City leaders formed a commission in 1850 to investigate the problem of disease-causing sewer back-ups. The commission linked the high death rate among immigrants to the poor sanitary conditions in which they lived. It recommended collecting refuse and sewage to use as fertilizer. The commission also recommended dumping untreated sewage into the ocean, far from people’s homes. Engineers developed two systems to drain sewage into ocean locations where the tide was strong enough to carry away the discharged sewage. One system discharged near Deer Island, the other near Moon Island.

By the middle of the century, people began to install water closets (a room containing a toilet and often a washbowl) in their homes. These emptied the human waste into primitive and leaky sewers. Once again, sewage tainted Boston’s groundwater and local waterways.



Outhouse





City Facts: Chicago

Chicago had lots of water since it was built on a swamp. But more people meant more human waste. At first, people cut a channel into the sandbar at the mouth of the Chicago River to aid in waste removal. The water took the waste out into the river, and then into Lake Michigan.

The areas by the river and lake filled with people. Any new settlers had to live farther away from the river and lake. With no water to take away their waste, they had to find another solution. They dug pits to use as toilets. They also found that they could dig wells for their drinking water. But the land was very swampy, and the water moved through it easily. This meant that the waste from the “pit” toilets soon infected the drinking water.

Soon more and more people came to Chicago over land routes. This meant that they brought their livestock with them. Animal waste and bacteria from dead animals also got into the water supply. Between the pit toilets, the animal waste, and the dead animals in the streets, the water supply was completely contaminated.

Without clean water, disease became common. In 1849 and 1850 there were large cholera epidemics. By 1855, 1,800 people a month were dying from cholera in Chicago.

The city decided it had to do something. It did not want to bury sewer pipes in the swampy land. Instead, it decided to build

a sewer system on top of the existing land. It would then cover the pipes with dirt and “fill.” Finally, it would build new roads above the sewer pipes. But there was one problem. The houses’ and stores’ front doors would be underground. The city decided that the only solution was to raise the houses and buildings so that the doors would be aboveground. One by one, they raised the houses from their foundations. They laid sewer pipes and covered them with dirt. Then they laid new foundations for the houses. Finally, they lowered the houses onto their new, higher foundations. The whole “city-lifting” project took nearly 10 years to complete!

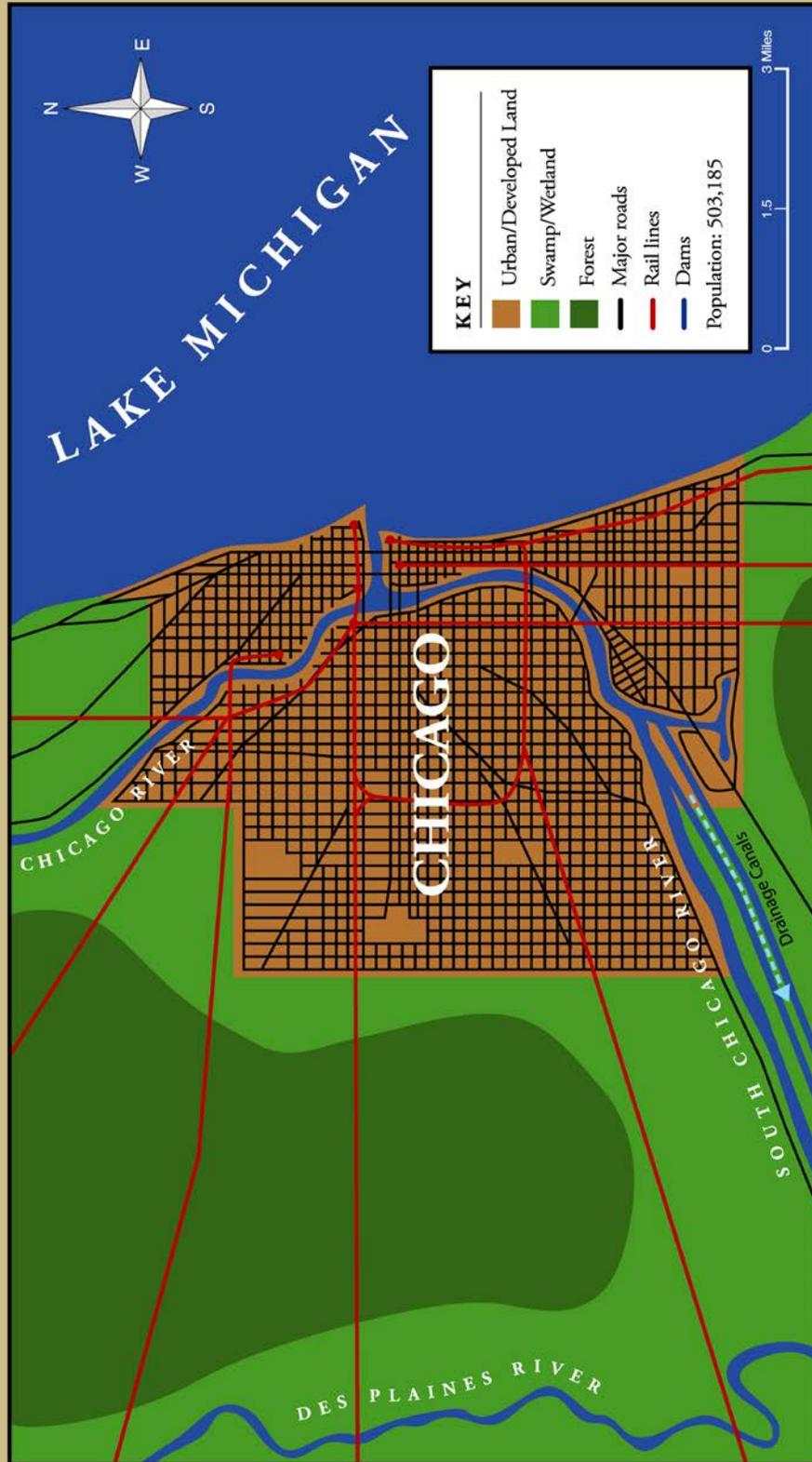


Crowded Chicago streets, 1906

City of Chicago, 1850



City of Chicago, 1880



City Facts: New York

New York planners knew that people need clean water. Lots of clean water. They need water to drink and cook with. They need water to bathe and clean with. They need water to move sewage away from their homes and into the seas. They need water to put out fires. When people do not have enough clean water to do all these things, they get ill. Typhus and cholera epidemics break out. New York had already experienced such epidemics in the early 1800s.

With more and more people coming into New York, land became scarce. People filled in swamps, sometimes using them as garbage dumps, and paved over rivers in order to have land for homes. Also, people had sometimes used the swamps and marshes as open toilets. New York City drained its wetlands and swamps, hoping that doing so would cut down on diseases. But this did not stop the epidemics. Because the wetlands act as water filters, straining out the wastes from water as the water soaks into the ground, they actually help rivers, lakes, and aquifers (water under the ground) stay healthy and full.

Having no wetlands soon meant less water in the area. The city experienced a number of very bad fires. They burned for days and days at a time. Firefighters came, but there was not enough water to put the fire out. Instead, they had to wait until the fire burned through all the wooden buildings. Whole



Trash on New York street

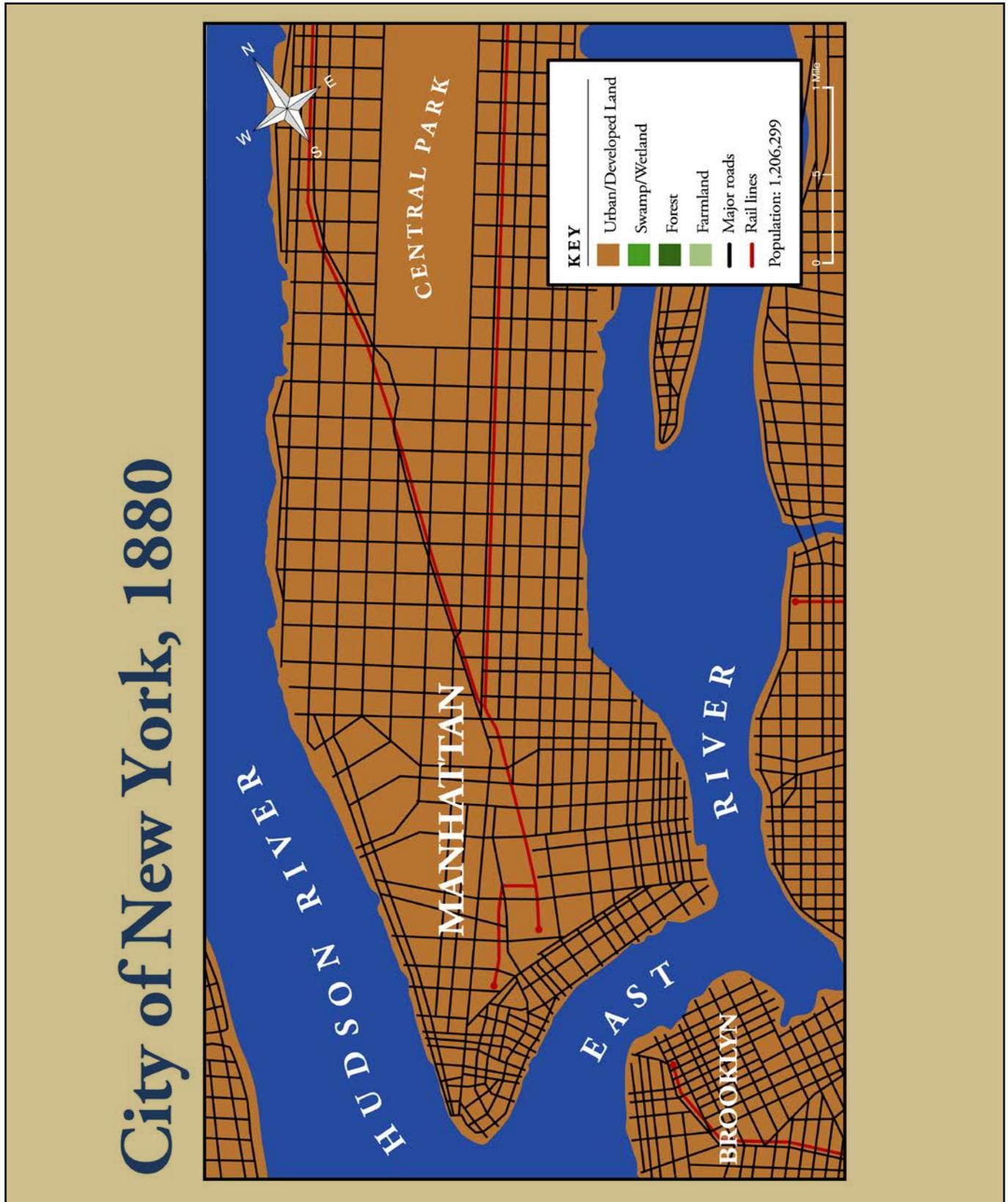
sections of the city burned at a time. Not only did people lose their homes and their jobs, they also had to breathe ash-filled air.

Finally the city decided to bring water down to New York City from farther up the Hudson River. Work started in 1837. They dammed the river and flooded the town of Katonah, creating a reservoir. This water was brought to New York City through a chain of pipes. Each section of pipe was lower than the one before it, so the water moved from the reservoir to the city by gravity.

The whole system was finished by 1842. The city built two reservoirs in Manhattan to hold the water. All in all, the water traveled a total of 41 miles. Once water began flowing through the pipes on June 22, 1842, it took 22 hours to reach Manhattan!

City of New York, 1850





City Facts: Philadelphia

In the early days, Philadelphia's water came from a group of wells, cisterns, and springs. But this system did not give the people of Philadelphia enough water. They needed water to drink and cook with. They needed water to bathe and clean with. They needed water to move sewage away from their homes and into the sea. They needed water to put out fires. When people do not have enough clean water to do all these things, they get ill. Typhus and cholera epidemics break out.

In the late 1700s, Philadelphia was a very busy port city. As in most port cities, the ships that brought goods and people from

other countries also brought diseases. In 1793, a huge plague of yellow fever broke out. It was very bad for two reasons. First, the open and standing sewers allowed mosquitoes infected with yellow fever to breed quickly and spread the fever. Second, the sewage tainted the drinking water. People thought that if they cooked the water or made tea out of it, they could use it. They were wrong. Many people died from the yellow fever epidemic. Soon the people began to think about how to get enough fresh water to drink.

The idea of getting water from the Schuylkill River to Philadelphia became popular. In 1817, Frederick Graff started to build a waterworks on the Schuylkill River. First, he used steam engines to lift water from the river and onto a hill called Fairmount. In 1819, the city built a dam at Fairmount and bought the rights to the water power. By 1822, a series of waterwheels replaced the steam engines.

A park and restaurant sprang up near the dam. The Fairmount Waterworks quickly became a huge tourist attraction. Thousands visited the site, which increased the need for water and sanitation.

By 1843, the waterworks brought an average of 5.3 million gallons of water a day to its 28,000 customers, and additional visitors, in Philadelphia. Having enough good, clean water in Philadelphia drew even more people to the city. As more and more people came, they started businesses. Both the people and businesses created more waste. Everyone counted on the same river to carry away the waste and the waterworks to keep delivering water.

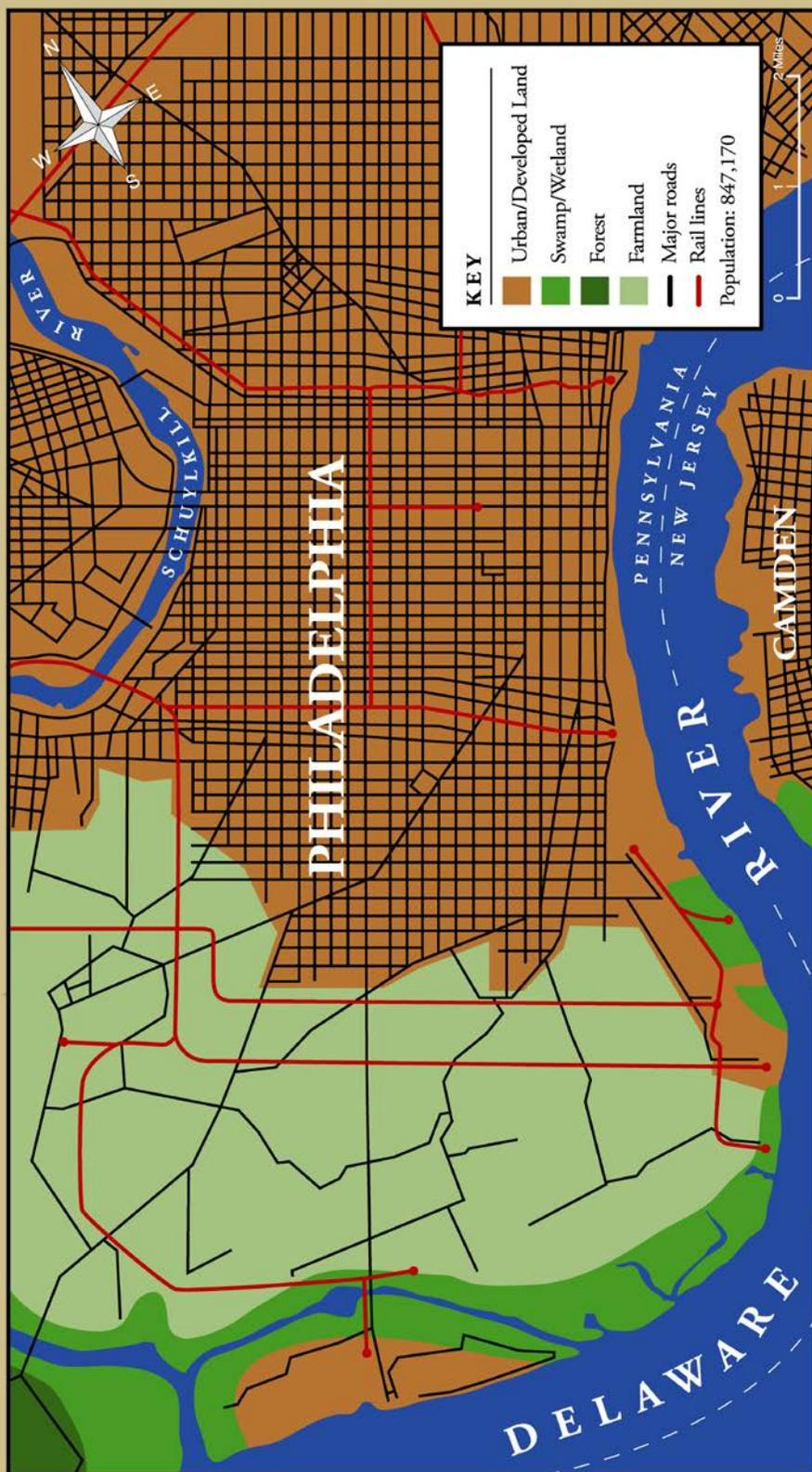


Mosquito

City of Philadelphia, 1815



City of Philadelphia, 1880





California STATE BOARD OF
EDUCATION

California Education and the Environment Initiative

